

W02903-475



Quanterra Incorporated  
13715 Rider Trail North  
Earth City, Missouri 63045

314 298-8566 Telephone  
314 298-8757 Fax

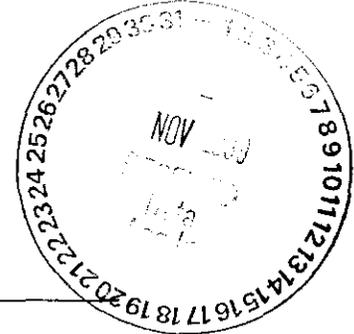
CASE NARRATIVE

0071299

Bechtel Hanford Incorporated  
3350 George Washington Way  
Richland, Washington 99352

October 28, 1999

Attention: Joan Kessner



Project Number	:	550.267
SDG	:	W02903
Number of Samples	:	One (1)
Sample Matrix	:	Soil
Data Deliverable	:	Summary
Date SDG Closed	:	September 16, 1999



EDMC

II. Introduction

On September 16, 1999, one (1) "soil" sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. The samples were received at Quanterra, St. Louis on 9/17/99 at a temperature of 2 degrees C. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID:

<u>St. Louis ID</u>	<u>BHI ID</u>	<u>SAF ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
22147-001	B0WBR3	B99-078	SOIL	16-SEP-99

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested:

- ICP Metals - 6010A
- Mercury - 7471
- Chromium Hex - 7196
- VOA - 8260A (TCL + add ons)
- Semi-Volatiles - 8270A
- TPH - Diesel Range - WTPH-D
- PCB - 8082

Deviation from Request: Semi-Volatiles were analyzed by method 8270C.

000002

Bechtel Hanford Incorporated  
October 28, 1999  
Project Number: 550.265  
SDG: W02903  
Page 2

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#### IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank  
QCLCS- Quality Control Laboratory Control Sample, Blank Spike  
MS- Matrix Spike.  
DUP- Matrix Duplicate  
MSD- Matrix Spike Duplicate.

#### V. Comments

General: The term "Detection Limit" used in the analytical data reports refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

Please refer to the attached cross-reference table for the standard preparation methods used at Quanterra, St. Louis.

Metals: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

The recoveries of the Mercury (189%) and Barium (318%) matrix spikes were greater than 125%, therefore all associated data was flagged with a "N". The recoveries of the matrix spike duplicates met criteria for these elements.

Wet Chemistry: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Duplicate were analyzed with each preparation batch per the protocol for this analysis. There were no comments or non-conformances associated with the Hexavalent Chromium data.

Volatiles: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

Bechtel Hanford Incorporated  
October 28, 1999  
Project Number: 550.265  
SDG: W02903  
Page 3

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The add-on compounds for the Volatile analysis (1-Propanol and Ethanol) can not be seen on the GC/MS as a TIC due to the fact that the major ions for these compounds are below the scan range of the instrument.

Semi-Volatiles:

A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

Butylated hydroxy Toluene was not detected in the TIC search.

The LCS for this SDG (SLCSK272E) appears to have been "double-spiked" with the LCS target compounds. Recoveries are twice what we normally see for all compounds spiked. The MS/MSD run on sample B0WBR3 had recoveries within QC limits for all spiking compounds. A NCM (#5890) was issued to document this issue. Because the MS/MSD were acceptable, no further action was taken.

TPH:

A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis. There are no comments of non-conformances associated with this data.

PCB:

A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

The RPD in the MS/MSD is outside of control limits for Aroclor 1016 and 1260. The individual spike recoveries are within QC criteria.

I certify that this Summary is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

  
\_\_\_\_\_  
Marti Ward  
St. Louis Project Manager

000004

*Quanterra St. Louis*

Sample Preparation Methods

*"Quanterra Standard" Preparation Method Used Unless Otherwise Noted*

Organic Preparation Methods	Matrix	Analysis	SW846 Reference
Separatory Funnel Liquid-Liquid <i>(Quanterra Standard)</i>	Liquid	Pesticides, PCBs, Semivolatiles, TPH (Diesel Range Organics), Herbicides, TCLP (Semivolatiles, Pesticides, Herbicides), Phenols, PAHs,	3510C
Continuous Liquid-Liquid	Liquid	Pesticides, Semivolatiles	3520C
Ultrasonic <i>(Quanterra Standard)</i>	Solid	Pesticides, PCBs, Semivolatiles, Herbicides, PAHs	3550B
Pressurized Fluid Extraction	Solid	Pesticides, PCBs, Semivolatiles, PAHs	3545
Waste Dilution <i>(Quanterra Standard)</i>	Solvent/Oil	Pesticides, PCBs, Semivolatiles, TPH, Herbicides, TCLP (Semivolatiles, Pesticides, Herbicides)	3580A
Purge and Trap <i>(Quanterra Standard)</i>	All	Volatiles, Gasoline Range Organics	5030B
Toxicity Characteristic Leaching Procedure <i>(Quanterra Standard)</i>	All	Pesticides, Semivolatiles, Herbicides, Volatiles, Metals	1311
Inorganic Preparation Methods	Matrix	Analysis	SW846 Reference
Acid Digestion <i>(Quanterra Standard)</i>	Liquid	ICP or FLAA Metals	3010A
Acid Digestion - Total Recoverable	Liquid	ICP or FLAA Metals	3005A
Acid Digestion <i>(Quanterra Standard)</i>	Liquid	GFAA Metals	3020A
Acid Digestion <i>(Quanterra Standard)</i>	Solid	ICP, FLAA, or GFAA Metals	3050B

000004A

LABORATORY NONCONFORMANCE MEMO (NCM)

Quanterra Incorporated

Project ID/Client: 39114 550267

NCM Initiated by/Date: K. Bowen 10-01-99 Project Manager: M. Mueller M. Ward

Sample Numbers/QC batch or lot numbers: 22214-001; 22147-001, -001MS, -001MSD

Tests: BNA13270

**Analytical Area (check appropriate area):**

<input type="checkbox"/> Sample control	<input type="checkbox"/> GC	<input type="checkbox"/> Wet chemistry	<input type="checkbox"/> Data review
<input type="checkbox"/> Organic preparation	<input type="checkbox"/> HPLC	<input type="checkbox"/> Metals	<input type="checkbox"/> Radiochemistry
<input type="checkbox"/> Inorganic preparation	<input checked="" type="checkbox"/> GC/MS	<input type="checkbox"/> Reporting	<input type="checkbox"/>

**Nonconformance (check appropriate area):** To be completed by analyst

**Holding Time Violations (exceeded by \_\_\_\_\_ days)**

*Category I: Laboratory Independent*

1. Holding time expired in transit

2. Sample rec'd > 48 hrs after sampling, or 1/2 holding time has expired

3. Test added by client after expiration

*Category II: Laboratory Dependent*

4. Instrument failure  5. Analyst error

6. Log-in error  7. Miscommunication

8. Other (explanation required) \_\_\_\_\_

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*Category III: Analysis Reruns (QA/QC)*

9. Surrogates  10. Internal standards

11. Spike recoveries  12. Blank contamination

*Category IV: Analysis Reruns (Confirmation)*

13. Second column  14. Contamination check

15. Confirmation of matrix effects

16. Other (explanation required) \_\_\_\_\_

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*Category V: Analysis Reruns (Dilution)*

17. Over calibration  18. Under calibration

19. Other (explanation required) \_\_\_\_\_

**Quality Assurance/Quality Control**

20. QC data reported outside of controls

21. Incorrect procedure used

22. SOP intentionally modified with QA and tech approval

23. Invalid instrument calibration

24. Received insufficient sample for proper analysis

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**Incorrect or Incomplete Client Deliverable**

25. Hardcopy deliverable error

26. Electronic deliverable error

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**Reported Detection Limits Elevated Due to:**

27. Sample matrix: Does not include high analyte content

28. Insufficient sample volume

29. Other (explanation required)

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**Miscellaneous**

30. Instrument/equipment Tag-out

31. Other (explanation required)  
LCS possibly double spiked.

**Notification (check appropriate area):**  Required  Not Required To be completed by project manager

Not notified by (name and date): M. Ward 10-1-99 Client's name and response: \_\_\_\_\_

writing narrative  By facsimile  Process "as is"  Re-sample

telephone  Other (explain)  On hold until \_\_\_\_\_  Other (explain) re-analyze

Manager (signature and date): M. Ward 10-1-99

0000048

**Corrective Action:** *To be completed and reviewed by all associates involved*

**Problem Description/Root Cause** Author's initials and date: KB 10-01-99

OCLES 2020861 was possibly double spiked. ms/msd looked fine.

**Corrective Actions (Short Term)** Author's initials and date: KB 10-01-99

Report as is.

**Corrective Actions to Prevent Reoccurrence (Long Term)**

Corrective Action approved by (Supervisor/Group Leader) and date: \_\_\_\_\_

**Additional Comments:**

Corrective Action to be completed by (if other than Supervisor/Group Leader): \_\_\_\_\_

Date Corrective Action is to be completed: \_\_\_\_\_

**Quality Assurance Review** *To be completed by a QA associate*

Anomaly  Deficiency  Notified Ops/Sys Manager (Initials) \_\_\_\_\_

Further action required: \_\_\_\_\_

Further action assigned to: \_\_\_\_\_

QA signature: [Signature] Date: 10-01-99

**Corrective Action Verification:** *To be completed by a QA associate*

Verification not required or requested

Verified / CA completed on: \_\_\_\_\_ by \_\_\_\_\_

Cannot verify (specify reason) \_\_\_\_\_

Verified by: \_\_\_\_\_ Date: \_\_\_\_\_

**Nonconformance Memo Closure:**

QA signature: \_\_\_\_\_ Date: \_\_\_\_\_

000004C

W029103

Quanterra September 20, 1999 11:42 am

Account: 10722 Project: 550.267 Quanterra-Richland QAS No. 550.267 Rev. 0  
Master Sample Login: 22147

Project Manager: M. Ward

Reviewed by and Date: J. Smith 9-20-99

Sample Header Template:

Sample No. Comments # Container Type	Client ID	C-Matrix Analysis	Date: Collected Class Preservative	Received Anal. Due Date	Due Hold Date Site	Shipper	Rad Category Rad Sample No. (Container Numbers: # Filled)
22147-001 SAF B99-078//ICAP=See QAS for list.//VOA=Report 1-propanol and ethanol as part of 8260 list.	B0WBR3	Soil	14-SEP-99 13:40	16-SEP-99 11:30	15-OCT-99	FED-EX	3* R9196-001
1 AN - Amber Glass-500ml		CR6/7196/Q4	S COLD	08-OCT-99	15-SEP-99	S14D	(461868:99)
1		HG/7471/Q4	S COLD	08-OCT-99	12-OCT-99	S14D	(461868:99)
1		ICAPT/6010A/Q4	S COLD	08-OCT-99	12-MAR-00	S14D	(461868:99)
1 AN - Amber Glass-250ML		BNA/8270C/Q4	S COLD	08-OCT-99	28-SEP-99	S14D	(461869:99)
1		PCB/8082/Q4	S COLD	08-OCT-99	28-SEP-99	S14D	(461869:99)
1		PM/1T/Q4	S COLD	08-OCT-99	12-MAR-00	S14D	(461869:99)
1		TPH/8015/Q4	S COLD	08-OCT-99	28-SEP-99	S14D	(461869:99)
1 AN - Amber Glass-60ML		RAD/CSCREEN/Q4	S COLD	08-OCT-99	14-MAR-00	V9	(461867:99)
1		VOA/8260/Q4	S COLD	08-OCT-99	28-SEP-99	V9	(461867:99)
22147-001DUP SAF B99-078	B0WBR3	Soil	14-SEP-99 13:40	16-SEP-99 11:30	15-OCT-99	FED-EX	3* R9196-001
1 AN - Amber Glass-500ml		CR6/7196/Q4	S COLD	08-OCT-99	15-SEP-99	S14D	(461868:99)
22147-001MS SAF B99-078//ICAP=See QAS for list.//VOA=Report 1-propanol and ethanol as part of 8260 list.	B0WBR3	Soil	14-SEP-99 13:40	16-SEP-99 11:30	15-OCT-99	FED-EX	3* R9196-001
1 AN - Amber Glass-500ml		CR6/7196/Q4	S COLD	08-OCT-99	15-SEP-99	S14D	(461868:99)
1		HG/7471/Q4	S COLD	08-OCT-99	12-OCT-99	S14D	(461868:99)
1		ICAPT/6010A/Q4	S COLD	08-OCT-99	12-MAR-00	S14D	(461868:99)
1 AN - Amber Glass-250ML		BNA/8270C/Q4	S COLD	08-OCT-99	28-SEP-99	S14D	(461869:99)
1		PCB/8082/Q4	S COLD	08-OCT-99	28-SEP-99	S14D	(461869:99)
1		TPH/8015/Q4	S COLD	08-OCT-99	28-SEP-99	S14D	(461869:99)
1 AN - Amber Glass-60ML		VOA/8260/Q4	S COLD	08-OCT-99	28-SEP-99	V9	(461867:99)
22147-001MSD SAF B99-078//ICAP=See QAS for list.//VOA=Report 1-propanol and ethanol as part of 8260 list.	B0WBR3	Soil	14-SEP-99 13:40	16-SEP-99 11:30	15-OCT-99	FED-EX	3* R9196-001
1 AN - Amber Glass-500ml		HG/7471/Q4	S COLD	08-OCT-99	12-OCT-99	S14D	(461868:99)
1		ICAPT/6010A/Q4	S COLD	08-OCT-99	12-MAR-00	S14D	(461868:99)
1 AN - Amber Glass-250ML		BNA/8270C/Q4	S COLD	08-OCT-99	28-SEP-99	S14D	(461869:99)
1		PCB/8082/Q4	S COLD	08-OCT-99	28-SEP-99	S14D	(461869:99)
1		TPH/8015/Q4	S COLD	08-OCT-99	28-SEP-99	S14D	(461869:99)
1 AN - Amber Glass-60ML		VOA/8260/Q4	S COLD	08-OCT-99	28-SEP-99	V9	(461867:99)

3\*=Sample has not been rad screened.

W02903

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector Bowers/Trice	Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator TRENT, SJ	Price Code 8N	Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU	Sampling Location 200 Bpond (B8758) <15'	SAF No. B99-078			
Ice Chest No. ERC 99 008	Field Logbook No. EL-1511	Method of Shipment Gov vehicle FED EX			
Shipped To Quanterra Incorporated, St. Louis.	Offsite Property No. A990256	Bill of Lading/Air Bill No. 423579529540			

COA 8909-17-99  
Dow Dow 020007 671C

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	Cool 4C	Cool 4C	Cool 4C	None					
		aG	aG	aG	aG	aG	None			
Special Handling and/or Storage	Type of Container	1	1	1	1					
	No. of Container(s)	60mL	500 250mL 44-19	250mL	509mL	20ml				

SAMPLE ANALYSIS	VOA - 8260A (TCL); VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D, PCBs - 8082	See item (2) in Special Instructions	Activity Score

Sample No.	Matrix *	Sample Date	Sample Time								
B0WBR3	Soil	9-14-99	1340	X	X	X					

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By <i>Doris Dow</i> Date/Time <i>9-14-99 1700</i>	Received By <i>B. of B</i> Date/Time <i>9-14-99 1700</i>	See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U. Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.  (1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196 (2) Gamma Spectroscopy {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Strontium-89,90 -- Total Sr; Total Uranium {Uranium}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241	Soil Water Vapor Other Solid Other Liquid
Relinquished By <i>Reber IB</i> Date/Time <i>9/16/99 11:30</i>	Received By <i>Brent Potter</i> Date/Time <i>9/16/99 11:30</i>		
Relinquished By <i>Brent Potter</i> Date/Time <i>9/16/99 11:30</i>	Received By <i>Fed Express</i> Date/Time <i>9/16/99 11:30</i>		
Relinquished By <i>Fed Ex</i> Date/Time <i>9-17-99 9:20 AM</i>	Received By <i>[Signature]</i> Date/Time <i>9/17/99</i>		
LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Login No.: 22147

Condition Upon Receipt Variance Report  
St. Louis Laboratory

1102903

Client: Bechtel/Hanford

Date: 9-17-99 Time: 0840

Project No: 500-267

Initiated by: [Signature]

Shipper/No: FedEx 62000267K

RFA/COC Numbers: B99-078-128

Condition/Variance (Check all that apply):

1. <input type="checkbox"/> Sample received broken/leaking.	8. <input type="checkbox"/> Sample ID on container does not match sample ID on paperwork. Explain: _____
2. <input type="checkbox"/> Sample received without proper preservative.	
<input type="checkbox"/> Cooler temperature not within 4-C ± 2-C	
Record temperature: _____	
<input type="checkbox"/> pH _____	9. <input type="checkbox"/> All coolers on airbill not received with shipment.
<input type="checkbox"/> other: _____	10. <input type="checkbox"/> Other (explain below): _____
3. <input type="checkbox"/> Sample received in improper container.	
4. <input type="checkbox"/> Sample received without proper paperwork. Explain: _____	
5. <input type="checkbox"/> Paperwork received without sample.	
6. <input type="checkbox"/> No sample ID on sample container.	
7. <input type="checkbox"/> Custody tape disturbed/broken/missing/not tamper evident type (circle all that apply).	

No variances were noted during sample receipt. Cooler Temperature Upon Receipt: 2°

Temperature Variance Does Not Affect the Following Analyses: \_\_\_\_\_

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Corrective Action:

Client's Name: \_\_\_\_\_ Informed verbally on: \_\_\_\_\_ By: \_\_\_\_\_

Client's Name: \_\_\_\_\_ Informed in writing on: \_\_\_\_\_ By: \_\_\_\_\_

Sample(s) processed "as is".

Comments: \_\_\_\_\_  
Sample(s) on hold until: \_\_\_\_\_ If released, notify: \_\_\_\_\_

Sample Control Supervisor Review: [Signature] Date: 9/17/99

Project Management Review: Jennifer Smith Date: 9-20-99

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

Bechtel Hanford Inc.  
 3350 George Washington Way  
 MSIN H9-03  
 Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Volatiles  
 Method: SW846 8260A  
 Matrix: SOLID

Sample Date : 09/14/99  
 Receipt Date : 09/16/99  
 Report Date : 10/26/99

Client ID: B0WBR3

Quanterra ID : 22147-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chloromethane	74-87-3	QCBLK207879-1	09/25/99	09/25/99	10	UG/KG	U	10	1
Bromomethane	74-83-9	QCBLK207879-1	09/25/99	09/25/99	10	UG/KG	U	10	1
Vinyl Chloride	75-01-4	QCBLK207879-1	09/25/99	09/25/99	10	UG/KG	U	10	1
Chloroethane	75-00-3	QCBLK207879-1	09/25/99	09/25/99	10	UG/KG	U	10	1
Methylene Chloride	75-09-2	QCBLK207879-1	09/25/99	09/25/99	7	UG/KG	B	5	1
Acetone	67-64-1	QCBLK207879-1	09/25/99	09/25/99	10	UG/KG	BJ	21	1
Carbon Disulfide	75-15-0	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
1,1-Dichloroethene	75-35-4	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
1,1-Dichloroethane	75-34-3	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
1,2-Dichloroethene (total)	540-59-0	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Chloroform	67-66-3	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
1,2-Dichloroethane	107-06-2	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
2-Butanone (MEK)	78-93-3	QCBLK207879-1	09/25/99	09/25/99	21	UG/KG	U	21	1
1,1,1-Trichloroethane	71-55-6	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Carbon Tetrachloride	56-23-5	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Bromodichloromethane	75-27-4	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
1,2-Dichloropropane	78-87-5	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
cis-1,3-Dichloropropene	10061-01-5	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Trichloroethene	79-01-6	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Dibromochloromethane	124-48-1	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
1,1,2-Trichloroethane	79-00-5	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Benzene	71-43-2	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
trans-1,3-Dichloropropene	10061-02-6	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Bromoform	75-25-2	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
4-Methyl-2-Pentanone (MIBK)	108-10-1	QCBLK207879-1	09/25/99	09/25/99	21	UG/KG	U	21	1
2-Hexanone	591-78-6	QCBLK207879-1	09/25/99	09/25/99	21	UG/KG	U	21	1
Tetrachloroethene	127-18-4	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Toluene	108-88-3	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
1,1,2,2-Tetrachloroethane	79-34-5	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Chlorobenzene	108-90-7	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Ethylbenzene	100-41-4	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Styrene	100-42-5	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Xylene (total)	1330-20-7	QCBLK207879-1	09/25/99	09/25/99	5	UG/KG	U	5	1
Bromofluorobenzene	460-00-4	QCBLK207879-1	09/25/99	09/25/99	79	%REC			1
Dibromofluoromethane	1868-53-7	QCBLK207879-1	09/25/99	09/25/99	108	%REC			1
Toluene-d8	2037-26-5	QCBLK207879-1	09/25/99	09/25/99	93	%REC			1

Data is incomplete without Case Narrative

000009

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Volatiles  
Method: SW846 8260A  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Client ID: BOWBR3

Quanterra ID : 22147-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dilution
1,1-Dichloroethene	75-35-4	QCBLK207879-1	09/25/99	09/25/99	90	#REC		1
Trichloroethene	79-01-6	QCBLK207879-1	09/25/99	09/25/99	89	#REC		1
Benzene	71-43-2	QCBLK207879-1	09/25/99	09/25/99	89	#REC		1
Toluene	108-88-3	QCBLK207879-1	09/25/99	09/25/99	92	#REC		1
Chlorobenzene	108-90-7	QCBLK207879-1	09/25/99	09/25/99	94	#REC		1
Bromofluorobenzene	460-00-4	QCBLK207879-1	09/25/99	09/25/99	80	#REC		1
Dibromofluoromethane	1868-53-7	QCBLK207879-1	09/25/99	09/25/99	103	#REC		1
Toluene-d8	2037-26-5	QCBLK207879-1	09/25/99	09/25/99	92	#REC		1

Data is incomplete without Case Narrative

000010

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Category: Volatiles  
Method: SW846 8260A  
Matrix: SOLID

Client ID: B0WBR3

Quanterra ID : 22147-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Detection	
						Qual.	Limit Dilution
1,1-Dichloroethene	75-35-4	QCBLK207879-1	09/25/99	09/25/99	83 %REC		1
Trichloroethene	79-01-6	QCBLK207879-1	09/25/99	09/25/99	87 %REC		1
Benzene	71-43-2	QCBLK207879-1	09/25/99	09/25/99	93 %REC		1
Toluene	108-88-3	QCBLK207879-1	09/25/99	09/25/99	89 %REC		1
Chlorobenzene	108-90-7	QCBLK207879-1	09/25/99	09/25/99	93 %REC		1
Bromofluorobenzene	460-00-4	QCBLK207879-1	09/25/99	09/25/99	85 %REC		1
Dibromofluoromethane	1868-53-7	QCBLK207879-1	09/25/99	09/25/99	105 %REC		1
Toluene-d8	2037-26-5	QCBLK207879-1	09/25/99	09/25/99	93 %REC		1

Data is incomplete without Case Narrative

000011



1E  
VOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0WBR3

Lab Name: QUANTERRA MO

Contract: 550.267

Lab Code: ITMO

Case No.:

SAS No.:

SDG No.: W02903

Matrix: (soil/water) SOIL

Lab Sample ID: 22147-001

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: ESMP9616

Level: (low/med) LOW

Date Received: 09/16/99

% Moisture: not dec. 3

Date Analyzed: 09/25/99

GC Column: RTX-502.2 ID: 0.53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (mL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

Number TICs found: 0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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Bechtel Hanford Inc.  
 3350 George Washington Way  
 MSIN H9-03  
 Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Semivolatile  
 Method: SW846 8270C  
 Matrix: SOLID

Sample Date : 09/14/99  
 Receipt Date : 09/16/99  
 Report Date : 10/27/99

Client ID: B0WBR3

Quanterra ID : 22147-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
bis(2-Chloroethyl) Ether	111-44-4	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2-Chlorophenol	95-57-8	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
1,3-Dichlorobenzene	541-73-1	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
1,4-Dichlorobenzene	106-46-7	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
1,2-Dichlorobenzene	95-50-1	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2-Methylphenol	95-48-7	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2,2'-oxybis (1-Chloropropane)	108-60-1	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
N-nitroso-di-n-propylamine	621-64-7	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
4-Methylphenol	106-44-5	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Hexachloroethane	67-72-1	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Nitrobenzene	98-95-3	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Isophorone	78-59-1	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2-Nitrophenol	88-75-5	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2,4-Dimethylphenol	105-67-9	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
bis(2-Chloroethoxy)Methane	111-91-1	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2,4-Dichlorophenol	120-83-2	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
1,2,4-Trichlorobenzene	120-82-1	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Naphthalene	91-20-3	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
4-Chloroaniline	106-47-8	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Hexachlorobutadiene	87-68-3	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
4-Chloro-3-Methylphenol	59-50-7	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2-Methylnaphthalene	91-57-6	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Hexachlorocyclopentadiene	77-47-4	QCBLK208086-1	09/28/99	09/30/99	1700	UG/KG	U	1700	1
2,4,6-Trichlorophenol	88-06-2	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2,4,5-Trichlorophenol	95-95-4	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2-Chloronaphthalene	91-58-7	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2-Nitroaniline	88-74-4	QCBLK208086-1	09/28/99	09/30/99	1700	UG/KG	U	1700	1
Acenaphthylene	208-96-8	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2,6-Dinitrotoluene	606-20-2	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
3-Nitroaniline	99-09-2	QCBLK208086-1	09/28/99	09/30/99	1700	UG/KG	U	1700	1
Acenaphthene	83-32-9	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
2,4-Dinitrophenol	51-28-5	QCBLK208086-1	09/28/99	09/30/99	1700	UG/KG	U	1700	1
Dibenzofuran	132-64-9	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
4-Nitrophenol	100-02-7	QCBLK208086-1	09/28/99	09/30/99	1700	UG/KG	U	1700	1
2,4-Dinitrotoluene	121-14-2	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Fluorene	86-73-7	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
DimethylPhthalate	131-11-3	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Diethylphthalate	84-66-2	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
4-Chlorophenyl-Phenyl Ether	7005-72-3	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
4-Nitroaniline	100-01-6	QCBLK208086-1	09/28/99	09/30/99	1700	UG/KG	U	1700	1
4,6-Dinitro-2-Methylphenol	534-52-1	QCBLK208086-1	09/28/99	09/30/99	1700	UG/KG	U	1700	1
n-Nitrosodiphenylamine	86-30-6	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
4-Bromophenyl-Phenyl Ether	101-55-3	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Hexachlorobenzene	118-74-1	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Pentachlorophenol	87-86-5	QCBLK208086-1	09/28/99	09/30/99	1700	UG/KG	U	1700	1
Phenanthrene	85-01-8	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Anthracene	120-12-7	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Di-N-Butylphthalate	84-74-2	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Fluoranthene	206-44-0	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Pyrene	129-00-0	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
ButylBenzylPhthalate	85-68-7	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Benzo(a)Anthracene	56-55-3	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
3,3'-Dichlorobenzidine	91-94-1	QCBLK208086-1	09/28/99	09/30/99	1700	UG/KG	U	1700	1
Chrysene	218-01-9	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
bis(2-Ethylhexyl)Phthalate	117-81-7	QCBLK208086-1	09/28/99	09/30/99	38	UG/KG	J	340	1
di-N-OctylPhthalate	117-84-0	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Benzo(b)Fluoranthene	205-99-2	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Benzo(k)Fluoranthene	207-08-9	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1
Benzo(a)Pyrene	50-32-8	QCBLK208086-1	09/28/99	09/30/99	340	UG/KG	U	340	1

Data is incomplete without Case Narrative

000029

Bechtel Hanford Inc.  
 3350 George Washington Way  
 MSIN H9-03  
 Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Semivolatile  
 Method: SW846 8270C  
 Matrix: SOLID

Sample Date : 09/14/99  
 Receipt Date : 09/16/99  
 Report Date : 10/27/99

Client ID: BOWBR3

Quanterra ID : 22147-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK208086-1	09/28/99	09/30/99	74	%REC		1
2-Chlorophenol	95-57-8	QCBLK208086-1	09/28/99	09/30/99	69	%REC		1
1,4-Dichlorobenzene	106-46-7	QCBLK208086-1	09/28/99	09/30/99	51	%REC		1
N-nitroso-di-n-propylamine	621-64-7	QCBLK208086-1	09/28/99	09/30/99	78	%REC		1
1,2,4-Trichlorobenzene	120-82-1	QCBLK208086-1	09/28/99	09/30/99	60	%REC		1
4-Chloro-3-Methylphenol	59-50-7	QCBLK208086-1	09/28/99	09/30/99	81	%REC		1
Acenaphthene	83-32-9	QCBLK208086-1	09/28/99	09/30/99	72	%REC		1
4-Nitrophenol	100-02-7	QCBLK208086-1	09/28/99	09/30/99	67	%REC		1
2,4-Dinitrotoluene	121-14-2	QCBLK208086-1	09/28/99	09/30/99	82	%REC		1
Pentachlorophenol	87-86-5	QCBLK208086-1	09/28/99	09/30/99	62	%REC		1
Pyrene	129-00-0	QCBLK208086-1	09/28/99	09/30/99	86	%REC		1
2-Fluorophenol	367-12-4	QCBLK208086-1	09/28/99	09/30/99	71	%REC		1
Phenol-d5	4165-62-2	QCBLK208086-1	09/28/99	09/30/99	83	%REC		1
Nitrobenzene-d5	4165-60-0	QCBLK208086-1	09/28/99	09/30/99	64	%REC		1
2-Fluorobiphenyl	321-60-8	QCBLK208086-1	09/28/99	09/30/99	64	%REC		1
2,4,6-Tribromophenol	118-79-6	QCBLK208086-1	09/28/99	09/30/99	77	%REC		1
Terphenyl-d14	1718-51-0	QCBLK208086-1	09/28/99	09/30/99	78	%REC		1

Data is incomplete without Case Narrative

000031

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Semivolatile  
Method: SW846 8270C  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/27/99

Client ID: BOWBR3

Quanterra ID : 22147-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK208086-1	09/28/99	09/29/99	60	%REC		1
2-Chlorophenol	95-57-8	QCBLK208086-1	09/28/99	09/29/99	60	%REC		1
1,4-Dichlorobenzene	106-46-7	QCBLK208086-1	09/28/99	09/29/99	49	%REC		1
N-nitroso-di-n-propylamine	621-64-7	QCBLK208086-1	09/28/99	09/29/99	69	%REC		1
1,2,4-Trichlorobenzene	120-82-1	QCBLK208086-1	09/28/99	09/29/99	58	%REC		1
4-Chloro-3-Methylphenol	59-50-7	QCBLK208086-1	09/28/99	09/29/99	76	%REC		1
Acenaphthene	83-32-9	QCBLK208086-1	09/28/99	09/29/99	69	%REC		1
4-Nitrophenol	100-02-7	QCBLK208086-1	09/28/99	09/29/99	85	%REC		1
2,4-Dinitrotoluene	121-14-2	QCBLK208086-1	09/28/99	09/29/99	87	%REC		1
Pentachlorophenol	87-86-5	QCBLK208086-1	09/28/99	09/29/99	58	%REC		1
Pyrene	129-00-0	QCBLK208086-1	09/28/99	09/29/99	93	%REC		1
2-Fluorophenol	367-12-4	QCBLK208086-1	09/28/99	09/29/99	62	%REC		1
Phenol-d5	4165-62-2	QCBLK208086-1	09/28/99	09/29/99	70	%REC		1
Nitrobenzene-d5	4165-60-0	QCBLK208086-1	09/28/99	09/29/99	63	%REC		1
2-Fluorobiphenyl	321-60-8	QCBLK208086-1	09/28/99	09/29/99	61	%REC		1
2,4,6-Tribromophenol	118-79-6	QCBLK208086-1	09/28/99	09/29/99	76	%REC		1
Terphenyl-d14	1718-51-0	QCBLK208086-1	09/28/99	09/29/99	85	%REC		1

Data is incomplete without Case Narrative

000032

1B  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOWBR3
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Lab Name: QUANTERRA Contract: 550.267

Lab Code: ITSL Case No.: SAS No.: SDG No.: W02903

Matrix: (soil/water) SOIL Lab Sample ID: 22147-001

Sample wt/vol: 30.1 (g/mL) G Lab File ID: KSMP2968

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. 3 dec. \_\_\_\_\_ Date Extracted: 09/28/99

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/30/99

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
108-95-2	Phenol	340	U
111-44-4	Bis(2-chloroethyl) ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2-oxybis(1-Chloropropane)	340	U
621-64-7	N-Nitrosodipropylamine	340	U
106-44-5	4-Methylphenol	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	Bis(2-chloroethoxy) methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	1700	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	340	U
91-58-7	2-Chloronaphthalene	340	U

000036





1F  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET  
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0WBR3

Lab Name: QUANTERRA Contract: 550.267  
 Lab Code: ITSL Case No.: SAS No.: SDG No.: W02903  
 Matrix: (soil/water) SOIL Lab Sample ID: 22147-001  
 Sample wt/vol: 30.1 (g/mL) G Lab File ID: KSMP2968  
 Level: (low/med) LOW Date Received: 09/16/99  
 % Moisture: not dec. 3 dec. \_\_\_\_\_ Date Extracted: 09/28/99  
 Final Volume: 1000 Date Analyzed: 09/30/99  
 GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:  
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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000039

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: PCB's  
Method: EPA 8082  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Client ID: B0WBR3

Quanterra ID : 22147-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK207526-1	09/22/99	09/23/99	34	UG/KG	U	34	1
Aroclor-1221	11104-28-2	QCBLK207526-1	09/22/99	09/23/99	34	UG/KG	U	34	1
Aroclor-1232	11141-16-5	QCBLK207526-1	09/22/99	09/23/99	34	UG/KG	U	34	1
Aroclor-1242	53469-21-9	QCBLK207526-1	09/22/99	09/23/99	34	UG/KG	U	34	1
Aroclor-1248	12672-29-6	QCBLK207526-1	09/22/99	09/23/99	34	UG/KG	U	34	1
Aroclor-1254	11097-69-1	QCBLK207526-1	09/22/99	09/23/99	34	UG/KG	U	34	1
Aroclor-1260	11096-82-5	QCBLK207526-1	09/22/99	09/23/99	34	UG/KG	U	34	1
TCMX	877-09-8	QCBLK207526-1	09/22/99	09/23/99	94	%REC			1
DCB	2051-24-3	QCBLK207526-1	09/22/99	09/23/99	113	%REC			1

Data is incomplete without Case Narrative

000064

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: PCB's  
Method: EPA 8082  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Client ID: BOWBR3

Quanterra ID : 22147-001MS

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Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Detection	
							Qual.	Limit Dilution
Aroclor-1016	12674-11-2	QCBLK207526-1	09/22/99	09/23/99	65	%REC		1
Aroclor-1260	11096-82-5	QCBLK207526-1	09/22/99	09/23/99	76	%REC		1
TCMX	877-09-8	QCBLK207526-1	09/22/99	09/23/99	74	%REC		1
DCB	2051-24-3	QCBLK207526-1	09/22/99	09/23/99	73	%REC		1

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Data is incomplete without Case Narrative

000065

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: PCB's  
Method: EPA 8082  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Client ID: BOWBR3

Quanterra ID : 22147-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aroclor-1016	12674-11-2	QCBLK207526-1	09/22/99	09/23/99	88	%REC			1
Aroclor-1260	11096-82-5	QCBLK207526-1	09/22/99	09/23/99	100	%REC			1
TCMX	877-09-8	QCBLK207526-1	09/22/99	09/23/99	99	%REC			1
DCB	2051-24-3	QCBLK207526-1	09/22/99	09/23/99	112	%REC			1

Data is incomplete without Case Narrative

000066

FORM 1  
PCB ORGANICS ANALYSIS DATA SHEET

Quanterra-Richland SAMPLE NO.

BOWBR3

Lab Name: Contract: 550.267  
 Lab Code: Case No.: SAS No.: SDG No.: W02903  
 Matrix: (soil/water) SOIL Lab Sample ID: 22147-001  
 Sample wt/vol: 30.3 (g/mL) G Lab File ID: DB\_\_935  
 % Moisture: 3 decanted: (Y/N) N Date Received: 09/16/99  
 Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 09/22/99  
 Concentrated Extract Volume: 10 (mL) Date Analyzed: 09/23/99  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
12674-11-2-----	Aroclor-1016	34	U	
11104-28-2-----	Aroclor-1221	34	U	
1114-16-5-----	Aroclor-1232	34	U	
53469-21-9-----	Aroclor-1242	34	U	
12672-29-6-----	Aroclor-1248	34	U	
11097-69-1-----	Aroclor-1254	34	U	
11096-82-5-----	Aroclor-1260	34	U	
37324-23-5-----	Aroclor-1262	34	U	
11100-14-4-----	Aroclor-1268	34	U	

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: TPH  
Method: EPA 8015  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Client ID: B0WBR3

Quanterra ID : 22147-001

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Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dilution
Diesel	68334-30-5	QCBLK207589-1	09/23/99	09/27/99	26 MG/KG	U	26	1
Waste Oil	TFH/OILH	QCBLK207589-1	09/23/99	09/27/99	26 MG/KG	U	26	1
o-Terphenyl	84-15-1	QCBLK207589-1	09/23/99	09/27/99	101 %REC			1

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Data is incomplete without Case Narrative

003079

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: TPR  
Method: EPA 8015  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Client ID: BOWBR3

Quanterra ID : 22147-001MS

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Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dilution
Diesel	68334-30-5	QCBLK207589-1	09/23/99	09/28/99	74	*REC		1
o-Terphenyl	84-15-1	QCBLK207589-1	09/23/99	09/28/99	118	*REC		1

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Data is incomplete without Case Narrative

000080

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: TPH  
Method: EPA 8015  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Client ID: BCWBR3

Quanterra ID : 22147-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Diesel	68334-30-5	QCBLK207589-1	09/23/99	09/28/99	76	%REC			1
o-Terphenyl	84-15-1	QCBLK207589-1	09/23/99	09/28/99	98	%REC			1

Data is incomplete without Case Narrative

000081

FORM 1  
 TPH ORGANICS ANALYSIS DATA SHEET

Quanterra-Richland SAMPLE NO.

BOWBR3

Lab Name: Contract: 550.267  
 Lab Code: Case No.: SAS No.: SDG No.: W02903  
 Matrix: (soil/water) SOIL Lab Sample ID: 22147-001  
 Sample wt/vol: 20.1 (g/mL) G Lab File ID: FA\_\_125  
 % Moisture: 3 decanted: (Y/N) N Date Received: 09/16/99  
 Extraction: (SepF/Cont/Sonc) OTHER Date Extracted: 09/23/99  
 Concentrated Extract Volume: 5 (ml) Date Analyzed: 09/27/99  
 Injection Volume: 1.0 (uL) Dilution Factor: 1.0  
 GPC Cleanup: (Y/N) N pH: \_\_\_ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG		Q
	-----Diesel	26	U	
	-----Waste Oil	26	U	

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Mercury  
Method: EPA 7471  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BOWBR3	22147-001	Mercury	7439-97-6	QCBLK207803-1	09/24/99	09/24/99	0.017	MG/KG	UN	0.034	1
BOWBR3	22147-001MS	Mercury	7439-97-6	QCBLK207803-1	09/24/99	09/24/99	189	%REC	N		1
BOWBR3	22147-001MSD	Mercury	7439-97-6	QCBLK207803-1	09/24/99	09/24/99	103	%REC			1
NA	QCCLCS207803-1	Mercury	7439-97-6	QCBLK207803-1	09/24/99	09/24/99	100	%REC			2
NA	QCBLK207803-1	Mercury	7439-97-6	QCBLK207803-1	09/24/99	09/24/99	0.017	MG/KG	U	0.033	1

Data is incomplete without Case Narrative

000094

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: ICAP Metals  
Method: EPA 6010  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/27/99

Client ID: BOWBR3

Quanterra ID : 22147-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dilution
Arsenic	7440-38-2	QCBLK207592-1	09/23/99	09/23/99	1.8 MG/KG		1.0	1
Barium	7440-39-3	QCBLK207592-1	09/23/99	09/23/99	56.4 MG/KG	N	20.6	1
Beryllium	7440-41-7	QCBLK207592-1	09/23/99	09/23/99	0.20 MG/KG	B	0.52	1
Cadmium	7440-43-9	QCBLK207592-1	09/23/99	09/23/99	0.03 MG/KG	U	0.52	1
Chromium	7440-47-3	QCBLK207592-1	09/23/99	09/23/99	4.9 MG/KG		1.0	1
Copper	7440-50-8	QCBLK207592-1	09/23/99	09/23/99	12.8 MG/KG		2.6	1
Lead	7439-92-1	QCBLK207592-1	09/23/99	09/23/99	2.3 MG/KG		0.31	1
Nickel	7440-02-0	QCBLK207592-1	09/23/99	09/23/99	9.5 MG/KG		4.1	1
Selenium	7782-49-2	QCBLK207592-1	09/23/99	09/23/99	0.40 MG/KG	U	0.52	1
Silver	7440-22-4	QCBLK207592-1	09/23/99	09/23/99	0.07 MG/KG	U	1.0	1
Vanadium	7440-62-2	QCBLK207592-1	09/23/99	09/23/99	60.4 MG/KG		5.2	1
Zinc	7440-66-6	QCBLK207592-1	09/23/99	09/23/99	37.1 MG/KG		2.1	1

Data is incomplete without Case Narrative

000095

Echtel Hanford Inc.  
 3350 George Washington Way  
 MSIN H9-03  
 Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: ICAP Metals  
 Method: EPA 6010  
 Matrix: SOLID

Sample Date : 09/14/99  
 Receipt Date : 09/16/99  
 Report Date : 10/26/99

Client ID: BCWBR3

Quanterra ID : 22147-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dilution
Arsenic	7440-38-2	QCBLK207592-1	09/23/99	09/23/99	102 %REC			1
Barium	7440-39-3	QCBLK207592-1	09/23/99	09/23/99	318 %REC	N		1
Beryllium	7440-41-7	QCBLK207592-1	09/23/99	09/23/99	107 %REC			1
Cadmium	7440-43-9	QCBLK207592-1	09/23/99	09/23/99	81 %REC			1
Chromium	7440-47-3	QCBLK207592-1	09/23/99	09/23/99	112 %REC			1
Copper	7440-50-8	QCBLK207592-1	09/23/99	09/23/99	108 %REC			1
Lead	7439-92-1	QCBLK207592-1	09/23/99	09/23/99	99 %REC			1
Nickel	7440-02-0	QCBLK207592-1	09/23/99	09/23/99	101 %REC			1
Selenium	7782-49-2	QCBLK207592-1	09/23/99	09/23/99	96 %REC			1
Silver	7440-22-4	QCBLK207592-1	09/23/99	09/23/99	97 %REC			1
Vanadium	7440-62-2	QCBLK207592-1	09/23/99	09/23/99	94 %REC			1
Zinc	7440-66-6	QCBLK207592-1	09/23/99	09/23/99	93 %REC			1

Data is incomplete without Case Narrative

000096

Bechtel Hanford Inc.  
3350 George Washington Way  
MSIN H9-03  
Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: ICAP Metals  
Method: EPA 6010  
Matrix: SOLID

Sample Date : 09/14/99  
Receipt Date : 09/16/99  
Report Date : 10/26/99

Client ID: BOWBR3

Quanterra ID : 22147-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result Unit	Qual.	Detection Limit	Dilution
Arsenic	7440-38-2	QCBLK207592-1	09/23/99	09/23/99	102 %REC			1
Barium	7440-39-3	QCBLK207592-1	09/23/99	09/23/99	103 %REC			1
Beryllium	7440-41-7	QCBLK207592-1	09/23/99	09/23/99	107 %REC			1
Cadmium	7440-43-9	QCBLK207592-1	09/23/99	09/23/99	80 %REC			1
Chromium	7440-47-3	QCBLK207592-1	09/23/99	09/23/99	100 %REC			1
Copper	7440-50-8	QCBLK207592-1	09/23/99	09/23/99	112 %REC			1
Lead	7439-92-1	QCBLK207592-1	09/23/99	09/23/99	98 %REC			1
Nickel	7440-02-0	QCBLK207592-1	09/23/99	09/23/99	91 %REC			1
Selenium	7782-49-2	QCBLK207592-1	09/23/99	09/23/99	96 %REC			1
Silver	7440-22-4	QCBLK207592-1	09/23/99	09/23/99	96 %REC			1
Vanadium	7440-62-2	QCBLK207592-1	09/23/99	09/23/99	115 %REC			1
Zinc	7440-66-6	QCBLK207592-1	09/23/99	09/23/99	100 %REC			1

Data is incomplete without Case Narrative

000097

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: QUANTERRA\_MO Contract: 550.267
Lab Code: ITMO Case No.: SAS No.: SDG No.: W02903
SOW No.: SW846

Table with 2 columns: EPA Sample No. and Lab Sample ID. Rows include BOWBR3, BOWBR3SD, BOWBR3S and their corresponding Lab Sample IDs.

Were ICP interelement corrections applied ? Yes/No YES
Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO

Comments:

Blank lines for comments.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name:
Date: Title:



Bechtel Hanford Inc.  
 3350 George Washington Way  
 MSIN H9-03  
 Richland, WA 99352-1613

Project: Bechtel Hanford Inc.

Category: Hexavalent Chromium  
 Method: SW846 7196  
 Matrix: SOLID

Sample Date : 09/14/99  
 Receipt Date : 09/16/99  
 Report Date : 10/26/99

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BOWBR3	22147-001	Hexavalent Chro	18540-29-9	QCBLK209721-1	10/23/99	10/23/99	0.10	UG/G	U	0.10	1
BOWBR3	22147-001DUP	Hexavalent Chro	18540-29-9	QCBLK209721-1	10/23/99	10/23/99	0.10	UG/G	U	0.10	1
BOWBR3	22147-001MS	Hexavalent Chro	18540-29-9	QCBLK209721-1	10/23/99	10/23/99	86	%REC			1
NA	QCBLK209721-1	Hexavalent Chro	18540-29-9	QCBLK209721-1	10/23/99	10/23/99	0.10	UG/G	U	0.10	1
NA	QCCLS209721-1	Hexavalent Chro	18540-29-9	QCBLK209721-1	10/23/99	10/23/99	104	%REC			1

Data is incomplete without Case Narrative

000109

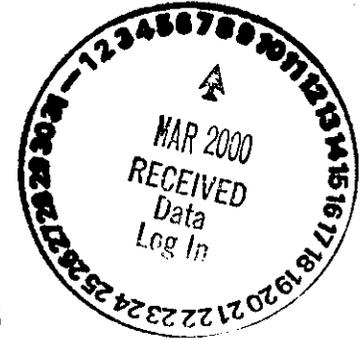
Analytical Data Package Prepared For

# Bechtel Hanford

Analysis By

**Quanterra Analytical Services**  
*Richland Laboratory*

Report Nbr: 9105



SDG No.	SAF No.	CLIENT ID No.	QUANTERRA ID No.
<del>W02903</del> <del>W02900</del> W02903 was correct SDG. Nayes 3/19/2000		B0WBR3 B0WBR3	9D2JQH10 9D2JQH20

Original Rad  
report received  
11/11/99 under SDG  
W02900. Lab  
resubmitted 3/8/2000  
under W02903.

Nayes



Bechtel Hanford, Inc.  
March 7, 2000  
Page 2

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### **Total Uranium**

Total Uranium by method RICH-RC-5058

#### III. Quality Control

The analytical results for each analysis performed under SDG W02903 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

#### IV. Comments

##### **Alpha Spectroscopy**

Plutonium-238, -239/40 by method RICH-RC-5010:

The LCS, batch blank, sample and sample duplicate (B0WBR3) results are within contractual requirements.

Americium-241 by method RICH-RC-5080:

The LCS, batch blank, sample and sample duplicate (B0WBR3) results are within contractual requirements.

Thorium-232 by method RICH-RC-5011:

The LCS, batch blank, sample and sample duplicate (B0WBR3) results are within contractual requirements.

Neptunium-237 by method RICH-RC-5009:

The LCS recovery (47%) was below acceptance limits. The batch was reanalyzed. The sample matrix spike recovery failed at 15%, however, the LCS was within limits and both sets of sample and duplicate analyses confirm activity less than the achieved MDAs. Since the achieved MDAs are significantly less than the CRDL, the data are accepted for reporting. Except as noted, the LCS, batch blank, sample and sample duplicate (B0WBR3) results are within contractual requirements.

##### **Gamma Spectroscopy**

Gamma Scan by method RICH-RC-5017:

The LCS, batch blank, sample and sample duplicate (B0WBR3) results are within contractual requirements.

Bechtel Hanford, Inc.  
March 7, 2000  
Page 3

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**Gas Proportional Counting**

Total Strontium by method RICH-RC-5006:

Sample aliquots analyzed were reduced based on screen results. MDAs are slightly greater than the CRDL, however, the detected activities for both the sample and duplicate sample analysis exceed the achieved MDAs by more than 10x. Therefore, the data are accepted for reporting. Except as noted, the LCS, batch blank, sample and sample duplicate (B0WBR3) results are within contractual requirements.

**Total Uranium**

Total Uranium by method RICH-RC-5058:

The LCS, batch blank, sample, sample duplicate (B0WBR3) and sample matrix spike (B0WBR3) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

  
Jackie Waddell  
Project Manager

### SAMPLE RESULTS

**LAB NAME:** QUANTERRA, Richland      **SDG: /RPT GRP:** W02903 / 9105  
**LAB SAMPLE ID:** 9D2JQH10      **MATRIX:** SOIL  
**CLIENT ID:** B0WBR3      **DATE RECEIVED:** 9/16/99 2:10:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	7.76E-01	J	0.0E+00	1.8E-01	7.29E-05	ug/g		RICHRC5058
AM-241	5.38E-02	U	7.9E-02	8.0E-02	1.13E-01	pCi/g	94.38%	RICHRC5080
PU-238	0.00E+00	U	0.0E+00	6.0E-02	6.68E-02	pCi/g	87.49%	RICHRC5010
PU239/40	7.39E-02	J	8.5E-02	8.6E-02	6.68E-02	pCi/g	87.49%	RICHRC5010
TH-228	5.06E-01	J	3.0E-01	3.3E-01	3.42E-01	pCi/g	92.65%	RICHRC5011
TH-230	4.88E-01	J	2.8E-01	3.0E-01	1.91E-01	pCi/g	92.65%	RICHRC5011
TH-232	6.09E-01	J	3.1E-01	3.4E-01	1.54E-01	pCi/g	92.65%	RICHRC5011
AM-241	-2.61E-04	U	3.5E-02	3.5E-02	5.87E-02	pCi/g		RICHRC5017
CO-60	-6.85E-03	U	1.2E-02	1.2E-02	1.89E-02	pCi/g		RICHRC5017
CS-137	1.25E-01		2.5E-02	2.5E-02	1.94E-02	pCi/g		RICHRC5017
EU-152	-1.16E-02	U	2.8E-02	2.8E-02	4.61E-02	pCi/g		RICHRC5017
EU-154	8.41E-03	U	3.6E-02	3.6E-02	6.17E-02	pCi/g		RICHRC5017
EU-155	4.02E-02	U	3.2E-02	3.2E-02	5.29E-02	pCi/g		RICHRC5017
RA-226	4.01E-01		6.5E-02	6.5E-02	3.28E-02	pCi/g		RICHRC5017
RA-228	5.37E-01		1.1E-01	1.1E-01	6.51E-02	pCi/g		RICHRC5017
STRONTIUM	2.07E+01		1.9E+00	6.2E+00	1.41E+00	pCi/g	93.10%	RICHRC5006

Number of Results: 16

### SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: 9D2JQH20      MATRIX: SOIL  
CLIENT ID: B0WBR3      DATE RECEIVED: 9/16/99 2:10:00 PM

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ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
NP-237	0.00E+00	U	0.0E+00	9.4E-03	1.04E-02	pCi/g	100.00%	RICHRC5009

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Number of Results: 1

### DUPLICATE RESULTS

**LAB NAME:** QUANTERRA, Richland      **SDG: /RPT GRP:** W02903 / 9105  
**LAB SAMPLE ID:** D2JQH18R      **MATRIX:** SOIL  
**CLIENT ID:** B0WBR3 DUP      **DATE RECEIVED:** 9/16/99 2:10:00 PM  
**ORIG LAB SAMPLE ID:** 9D2JQH10

ANALYTE	DUP RESULT	Q	COUNTING ERROR ( 2 s)	TOTAL ERROR ( 2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
TH-228	5.59E-01	J	3.2E-01	3.5E-01	3.50E-01	pCi/g	91.68%	RICHRC5011	5.06E-01	10.04%
TH-230	6.62E-01	J	3.2E-01	3.6E-01	1.58E-01	pCi/g	91.68%	RICHRC5011	4.88E-01	30.30%
TH-232	6.23E-01	J	3.1E-01	3.5E-01	1.58E-01	pCi/g	91.68%	RICHRC5011	6.09E-01	2.31%

Number of Results: 3

### DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2JQH19R MATRIX: SOIL  
CLIENT ID: B0WBR3 DUP DATE RECEIVED: 9/16/99 2:10:00 PM  
ORIG LAB SAMPLE ID: 9D2JQH10

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
PU-238	0.00E+00	U	0.0E+00	7.8E-02	8.62E-02	pCi/g	64.21%	RICHRC5010	0.00E+00	0.00%
PU239/40	9.28E-02	U	1.1E-01	1.1E-01	1.28E-01	pCi/g	64.21%	RICHRC5010	7.39E-02	22.69%

Number of Results: 2

**DUPLICATE RESULTS**

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2JQH1AR      MATRIX: SOIL  
CLIENT ID: B0WBR3 DUP      DATE RECEIVED: 9/16/99 2:10:00 PM  
ORIG LAB SAMPLE ID: 9D2JQH10

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ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
AM-241	0.00E+00	U	0.0E+00	7.6E-02	8.42E-02	pCi/g	89.08%	RICHRC5080	5.38E-02	200.00%

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Number of Results: 1

### DUPLICATE RESULTS

**LAB NAME:** QUANTERRA, Richland      **SDG: /RPT GRP:** W02903 / 9105  
**LAB SAMPLE ID:** D2JQH1CR      **MATRIX:** SOIL  
**CLIENT ID:** B0WBR3 DUP      **DATE RECEIVED:** 9/16/99 2:10:00 PM  
**ORIG LAB SAMPLE ID:** 9D2JQH10

ANALYTE	DUP RESULT	Q	COUNTING ERROR ( 2 s)	TOTAL ERROR ( 2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
AM-241	-8.68E-02	U	5.8E-02	5.8E-02	9.37E-02	pCi/g		RICHRC5017	-2.61E-04	198.80%
CO-60	1.91E-03	U	1.3E-02	1.3E-02	2.21E-02	pCi/g		RICHRC5017	-6.85E-03	354.79%
CS-137	1.07E-01		2.3E-02	2.3E-02	2.21E-02	pCi/g		RICHRC5017	1.25E-01	14.90%
EU-152	6.86E-04	U	4.1E-02	4.1E-02	5.74E-02	pCi/g		RICHRC5017	-1.16E-02	225.11%
EU-154	-8.23E-03	U	4.0E-02	4.0E-02	6.68E-02	pCi/g		RICHRC5017	8.41E-03	8655.17%
EU-155	-1.60E-02	U	4.1E-02	4.1E-02	6.62E-02	pCi/g		RICHRC5017	4.02E-02	463.29%
RA-226	4.17E-01		6.2E-02	6.2E-02	3.79E-02	pCi/g		RICHRC5017	4.01E-01	3.73%
RA-228	5.93E-01		1.1E-01	1.1E-01	7.58E-02	pCi/g		RICHRC5017	5.37E-01	9.96%

**Number of Results:** 8

### DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2JQH1DR MATRIX: SOIL  
CLIENT ID: B0WBR3 DUP DATE RECEIVED: 9/16/99 2:10:00 PM  
ORIG LAB SAMPLE ID: 9D2JQH10

ANALYTE	DUP RESULT	COUNTING Q ERROR ( 2 s)	TOTAL ERROR ( 2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
STRONTIUM	2.00E+01	1.9E+00	6.0E+00	1.37E+00	pCi/g	92.90%	RICHRC5006	2.07E+01	3.33%

Number of Results: 1

### DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2JQH1ER MATRIX: SOIL  
CLIENT ID: B0WBR3 DUP DATE RECEIVED: 9/16/99 2:10:00 PM  
ORIG LAB SAMPLE ID: 9D2JQH10

ANALYTE	DUP RESULT	COUNTING Q ERROR ( 2 s)	TOTAL ERROR ( 2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
TOTAL-URANIUM	8.81E-01	J 0.0E+00	2.1E-01	7.29E-05	ug/g		RICHRC5058	7.76E-01	12.68%

Number of Results: 1

### DUPLICATE RESULTS

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2JQH2JR      MATRIX: SOIL  
CLIENT ID: B0WBR3 DUP      DATE RECEIVED: 9/16/99 2:10:00 PM  
ORIG LAB SAMPLE ID: 9D2JQH20

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
NP-237	0.00E+00	U	0.0E+00	9.9E-03	1.10E-02	pCi/g	100.00%	RICHRC5009	0.00E+00	0.00%

Number of Results:

### BLANK RESULTS

LAB NAME: QUANTERRA, Richland      SDG /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MQX11B      MATRIX: SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
TH-228	-3.42E-03	U	2.6E-03	2.7E-03	3.78E-02	pCi/g	88.85%	RICHRC5011
TH-230	5.79E-03	U	1.2E-02	1.2E-02	1.57E-02	pCi/g	88.85%	RICHRC5011
TH-232	0.00E+00	U	0.0E+00	1.4E-02	1.57E-02	pCi/g	88.85%	RICHRC5011

Number of Results:

**BLANK RESULTS**

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR011B MATRIX: SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00	U	0.0E+00	1.6E-02	1.75E-02	pCi/g	47.67%	RICHRC5010
PU239/40	5.94E-03	U	1.3E-02	1.3E-02	2.60E-02	pCi/g	47.67%	RICHRC5010

Number of Results: 2

### BLANK RESULTS

LAB NAME: QUANTERRA, Richland      SDG /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR013X      MATRIX: SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-4.95E-04	U	9.9E-04	9.9E-04	2.49E-02	pCi/g	52.59%	RICHRC5010
PU239/40	-4.95E-04	U	9.9E-04	9.9E-04	2.49E-02	pCi/g	52.59%	RICHRC5010

Number of Results: 2

**BLANK RESULTS**

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR111B MATRIX: SOIL

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ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	5.06E-03	U	1.0E-02	1.0E-02	1.37E-02	pCi/g	82.59%	RICHRC5080

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Number of Results:

### BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR113X MATRIX: SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	4.11E-03	U	9.0E-03	9.0E-03	1.80E-02	pCi/g	91.94%	RICHRC5080

Number of Results: 1

### BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W02903 / 9105  
 LAB SAMPLE ID: D2MR511B MATRIX: SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	2.57E-03	U	3.7E-02	3.7E-02	6.17E-02	pCi/g		RICHRC5017
CO-60	-3.84E-04	U	7.7E-03	7.7E-03	1.36E-02	pCi/g		RICHRC5017
CS-137	-2.25E-03	U	7.3E-03	7.3E-03	1.25E-02	pCi/g		RICHRC5017
EU-152	2.30E-03	U	1.8E-02	1.8E-02	3.09E-02	pCi/g		RICHRC5017
EU-154	-1.52E-02	U	2.0E-02	2.0E-02	3.33E-02	pCi/g		RICHRC5017
EU-155	2.26E-02	U	1.7E-02	1.7E-02	3.00E-02	pCi/g		RICHRC5017
RA-226	9.88E-02	U	2.5E-02	2.5E-02	3.73E-02	pCi/g		RICHRC5017
RA-228	7.60E-02	U	3.2E-02	3.2E-02	6.13E-02	pCi/g		RICHRC5017

Number of Results: 8

### BLANK RESULTS

LAB NAME: QUANTERRA, Richland      SDG /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR711B      MATRIX: SOIL

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ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
STRONTIUM	6.36E-02	U	5.5E-02	5.8E-02	1.13E-01	pCi/g	94.80%	RICHRC5006

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Number of Results:

### BLANK RESULTS

LAB NAME: QUANTERRA, Richland      SDG /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MRA11B      MATRIX: SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
TOTAL-URANIUM	0.00E+00	U	0.0E+00	0.0E+00	7.29E-05	ug/g		RICHRC5058

Number of Results:

**BLANK RESULTS**

LAB NAME: QUANTERRA, Richland      SDG /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D82XC11B      MATRIX: SOIL

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ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
NP-237	0.00E+00	U	0.0E+00	9.5E-03	1.05E-02	pCi/g	100.00%	RICHRC5009

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Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MQX12S MATRIX: SOIL

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
TH-230	9.38E-01	J	1.5E-01	2.7E-01	2.45E-02	pCi/g	92.91%	1.14E+00	82.64%

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Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR012S      MATRIX: SOIL

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
PU239/40	3.44E+00		2.7E-01	6.6E-01	2.82E-02	pCi/g	62.64%	3.42E+00	100.73%

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Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR014M      MATRIX: SOIL

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ANALYTE	RESULT	COUNTING Q ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
PU239/40	3.19E+00	2.6E-01	6.2E-01	2.12E-02	pCi/g	64.13%	3.40E+00	93.94%

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Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR112S      MATRIX: SOIL

---

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
AM-241	4.14E+00		2.6E-01	7.4E-01	1.63E-02	pCi/g	104.54%	N/A	

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Number of Results:

### LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR114M      MATRIX: SOIL

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
AM-241	4.32E+00		2.6E-01	7.7E-01	1.59E-02	pCi/g	105.96%	4.54E+00	95.08%

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Number of Results: 1

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR512S MATRIX: SOIL

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
CS-137	3.35E-01		5.3E-02	5.3E-02	3.68E-02	pCi/g		3.09E-01	108.41%

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Number of Results: 1

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MR712S      MATRIX: SOIL

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ANALYTE	RESULT	COUNTING Q ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
STRONTIUM	1.05E+00	1.3E-01	3.2E-01	1.13E-01	pCi/g	95.10%	1.13E+00	92.86%

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Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2MRA12S      MATRIX: SOIL

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
TOTAL-URANIUM	2.12E-01	J	0.0E+00	3.4E-02	7.29E-05	ug/g		2.02E-01	104.80%

---

Number of Results:

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D82XC12S MATRIX: SOIL

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ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
NP-237	7.36E-01	J	1.1E-01	2.0E-01	1.63E-02	pCi/g	100.00%	9.05E-01	81.37%

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Number of Results: 1

### MATRIX SPIKE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2JQH1FW MATRIX: SOIL

ANALYTE	SPIKE RESULT*	COUNTING Q ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	SAMPLE RESULT	EXPECTED	RECOVERY
TOTAL-URANIUM	9.96E+00	0.0E+00	2.4E+00	7.29E-05	ug/g	7.76E-01	8.25E+00	120.85%

Number of Results:

\*Spike Result Corrected For Sample Result  
Result = IDL When Not Detecte  
(Q)ualifiers: U = Analyte result < MDA/IDL,  
J = No U qualifier and result < RDL.

### MATRIX SPIKE RESULTS

LAB NAME: QUANTERRA, Richland      SDG: /RPT GRP: W02903 / 9105  
LAB SAMPLE ID: D2JQH2KW      MATRIX: SOIL

ANALYTE	SPIKE RESULT*	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	SAMPLE RESULT	EXPECTED	RECOVERY
NP-237	1.37E-01	J	4.8E-02	5.8E-02	1.68E-02	pCi/g	0.00E+00	9.04E-01	15.18%

Number of Results:

\*Spike Result Corrected For Sample Result  
Result = IDL When Not Detected  
(Q)ualifiers: U = Analyte result < MDA/IDL,  
J = No U qualifier and result < RDL.

<b>Bechtel Hanford Inc.</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>			<b>B99-078-128</b>	Page <u>1</u> of <u>1</u>	
Collector Bowers/Trice		Company Contact Chris Cearlock		Telephone No. 372-9574	Project Coordinator Trent, SJ	Price Code <b>8N</b>	Data Turnaround <b>45 Days</b>
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 Bpond (B8758) <15'		SAF No. B99-078			
Ice Chest No. <b>RED - LUNCH BOX SIZE</b>		Field Logbook No. EL-1511		Method of Shipment Gov vehicle			
Shipped To Quanterra Incorporated		Offsite Property No. <b>N/A</b>		Bill of Lading/Air Bill No. <b>N/A</b>			

COA **840 9-17-99**  
**Down D200W7 671C**

POSSIBLE SAMPLE HAZARDS/REMARKS <b>Q-27038</b>	Preservation	Cool 4C	Cool 4C	Cool 4C	None					
		Type of Container	aG	aG	aG	aG	None	P		
Special Handling and/or Storage	No. of Container(s)	1	1	1	1					
	Volume	60mL	250mL	250mL	250mL	250mL	20mL			

**SIX W02903 SAMPLE ANALYSIS**  
**W02900 2/3 J9I160259**  
**3/7/00**

VOA - 8260A (TC1), VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (1) in Special Instructions	Semi-VOA - 8270A (TC1), TPH Diesel Range - WT191D, PCBs - 8082	See item (2) in Special Instructions	Activity (SCO)
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Sample No	Matrix *	Sample Date	Sample Time								
BOWBR3 <b>D25QH</b>	Soil	<b>9-14-99</b>	<b>1340</b>	X	X	X	X	X			<b>Down 80</b>

**deleted BPA 9/16/99**

<b>CHAIN OF POSSESSION</b>		<b>Sign/Print Names</b>		<b>SPECIAL INSTRUCTIONS</b>				<b>Matrix *</b>	
Relinquished By <b>Doris Dow</b> Date/Time <b>9-14-99/1700</b>		Received By <b>Ref IB</b> Date/Time <b>9-14-99/1700</b>		See chain of custody comments on SAF B99-078. Out of Gamma Spec. bottle also analyze for Np-237, isotopic U. Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.  (1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Copper, Nickel, Vanadium, Zinc}; Mercury - 7471 - (CV); Chromium Hex - 7196 (2) Gamma Spectroscopy {Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}, Strontium-89.90 -- (Total Sr) Total Uranium {Uranium-Isotopic (Plutonium) Isotopic Thorium} {Thorium-232}, Americium-241				Soil Water Vapor Other Solid Other Liquid	
Relinquished By <b>Refer IB</b> Date/Time <b>9/16/99 11:30</b>		Received By <b>Brent Port</b> Date/Time <b>9/16/99 11:30</b>							
Relinquished By <b>Brent Port</b> Date/Time <b>9/16/99 11:30</b>		Received By <b>SIGALE</b> Date/Time <b>9/16/99 11:30</b>							
Relinquished By <b>Phibans</b> Date/Time <b>9/16/99</b>		Received By <b>K. Adkins</b> Date/Time <b>9/16/99</b>							
<b>LABORATORY SECTION</b>		Received By		Collector unavailable to sign CoC				Date/Time	
<b>FINAL SAMPLE DISPOSITION</b>		Disposal Method		Disposed By				Date/Time	

<b>Bechtel Hanford Inc.</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>			B99-078-128	Page 1 of 1
Collector Bowers/Trice		Company Contact Chris Cearlock	Telephone No. 372-9574	Project Coordinator FRENT, SJ	Price Code 8N	Data Turnaround 45 Days
Project Designation 200 Area Source characterization - 200-CW-1 OU		Sampling Location 200 Bpond (B8758) <15'		SAF No. B99-078		
Ice Chest No. <i>RED - LUNCH BOX SIZE</i>		Field Logbook No. EL-1511		Method of Shipment Gov vehicle		
Shipped To Quanterra Incorporated		Offsite Property No. <i>N/A</i>		Bill of Lading/Air Bill No. <i>NO</i> <i>COA B99-17-89</i> <i>Download B200W7 671C</i>		

POSSIBLE SAMPLE HAZARDS/REMARKS  Q-27038	Preservation	Cool 4C	Cool 4C	Cool 4C	None						
	Type of Container	aG	aG	aG	aG	NONP					
	No. of Container(s)	1	1	1	1						
Special Handling and/or Storage	Volume	60mL	250mL	250mL	250mL 500mL	20mL					

*SDX*  
*WO2908* 3 *DB* - SAMPLE ANALYSIS  
*J9I160259*

VOA - 8260A (TCL), VOA - 8260A (Add-On) (1-Propanol, Ethanol)	See item (1) in Special Instructions	Semi-VOA - 8270A (TCL), TPH, Diesel Range - WTI, I.D., PCBs - 8082	See item (2) in Special Instructions	Activity SCO
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Sample No.	Matrix *	Sample Date	Sample Time							
BOWBR3 D2JQH	Soil	9-14-99	1340	X	X	X	X	X		Download

*deleted at 16/99*  
*BEP*

<b>CHAIN OF POSSESSION</b>		<b>Sign/Print Names</b>			<b>SPECIAL INSTRUCTIONS</b>				<b>Matrix *</b>	
Relinquished By <i>Dooris Dorr</i> Date/Time <i>9-14-99 1700</i>		Received By <i>R. F. B</i> Date/Time <i>9-14-99 1700</i>			See chain of custody comments on SAF B99-078 Out of Gamma Spec. bottle also analyze for Np-237, isotopic U, . Out of ICP bottle also analyze for NO2/NO3, IC anions, Sulfides, Ammonia, Total Cyanide, and pH.  (1) ICP Metals - 6010A (Supertrace) ; Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver; ICP Metals - 6010A (Supertrace Add-On) (Beryllium, Copper, Nickel, Vanadium, Zinc); Mercury - 7471 - (CV), Chromium Hex - 7196 (2) Gamma Spectroscopy (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Strontium-89,90 -- (Total Sr) Total Uranium (Uranium), Isotopic (Plutonium) Isotopic Thorium (Thorium-232), Americium-241				Soil Water Vapor Other Solid Other Liquid	
Relinquished By <i>Keler B</i> Date/Time <i>9/16/99 11:30</i>		Received By <i>Brent Port</i> Date/Time <i>9/16/99 11:30</i>								
Relinquished By <i>Brent Port</i> Date/Time <i>9/16/99 11:30</i>		Received By <i>SIGAL</i> Date/Time <i>9/16/99 11:30</i>								
Relinquished By <i>For Gale</i> Date/Time <i>9/16/99</i>		Received By <i>K. Adickens</i> Date/Time <i>9/16/99</i>								
LABORATORY SECTION		Received By <i>2100C on</i>							Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method			Disposed By				Date/Time	